CLAIMS

1. A method for packaging at least one microscopic device, comprising:

applying a sacrificial material to at least one microscopic device;

applying a layer of structural material adjacent the sacrificial material, the layer of structural material forming a housing adjacent at least a portion of the sacrificial material;

creating one or more apertures in the housing of structural material to expose at least a portion of the adjacent sacrificial material;

removing the sacrificial layer, wherein the housing of structural material with at least one aperture remains;

depositing a protective material adjacent the housing of structural material overlaying at least one aperture of the housing; and

curing the protective material.

2. The method of Claim 1, wherein the method further comprises:

providing a gas atmosphere, wherein the pressure is greater than or equal to 1 Pascal (Pa); and

providing a temperature of less than 600° Celsius (C).

3. The method of Claim 2, wherein the sacrificial material has a higher etch rate than the structural material.

4. The method of Claim 3, wherein the sacrificial material comprises either a photoresist or a polyimide material.

5. The method of Claim 2, wherein the structural layer is selected from a group of Silicon Dioxide (SiO_2) and Silicon Nitride (Si_3N_4).

6. The method of Claim 2, wherein the step of removing portions of the structural layer comprises use of sputter etching or ion beam milling.

7. The method of Claim 2, wherein the step of removing the sacrificial layer comprises use chemical etching.

8. The method of Claim 2, wherein the step of removing the sacrificial layer comprises use of either plasma ashing or plasma etching.

9. The method in Claim 2, wherein the step of depositing a protective material comprises wicking the protective material into at least one aperture of the housing.

10. The method of Claim 2, wherein the step of depositing the protective material comprises applying the protective material to at least a portion of the surface of the housing and allowing the protective material to flow into at least a portion of an aperture in the housing.

11. The method of Claim 2, wherein the step of applying a layer of material comprises forming a structural layer having a thickness of between about 0.2 microns and about 20 microns.

12. The method of Claim 2, wherein the step of applying a sacrificial material comprises forming a sacrificial layer having a thickness of between about 0.2 microns and about 10 microns.

13. An apparatus for packaging at least one microscopic device, comprising:

means for applying a sacrificial material to at least one microscopic device;

means for applying a layer of structural material adjacent the sacrificial material, the layer of structural material forming a housing adjacent at least a portion of the sacrificial material;

means for creating one or more apertures in the housing of structural material to expose at least a portion of the adjacent sacrificial material;

means for removing the sacrificial layer, wherein the housing of structural material with at least one aperture remains;

means for depositing a protective material adjacent the housing of structural material overlaying at least one aperture of the housing; and

means for curing the protective material.

14. The apparatus of Claim 13, the apparatus further comprises a means for providing a gas atmosphere, wherein the pressure is greater than or equal to 1 Pascal (Pa).

15. The apparatus of Claim 14, wherein the apparatus further comprises a means for providing a temperature of less than 600° Celsius (C).

16. The apparatus of Claim 13, wherein means for applying a structural material is configured to utilize a structural layer is selected from a group of Silicon Dioxide (SiO_2) and Silicon Nitride (Si_3N_4).

17. The apparatus of Claim 13, wherein means for removing portions of the structural layer is at least configured to use sputter etching or ion beam milling.

18. The apparatus of Claim 13, wherein the means for removing the sacrificial layer is at least configured to use chemical etching.

19. The apparatus of Claim 13, wherein the means for removing the sacrificial layer is at least configured to use plasma ashing or plasma etching.

20. The apparatus in Claim 13, wherein means for depositing a protective material is at least configured to utilize a protective material with a viscosity such that the protective material wicks into the housing with at least one aperture and is at least configured to not flow into movable structures.

21. The apparatus of Claim 13, wherein means for depositing a protective material is at least configured to utilize a protective material with a viscosity such that the protective material fills the apertures of the housing with at least one aperture and remains on the surface of the housing with at least one aperture.

22. The apparatus of Claim 13, wherein the means for applying a structural material applies a structural layer that is between 0.2 microns and 20 microns thick.

23. The apparatus of Claim 13, wherein the means for applying a sacrificial layer applies a sacrificial that is between 0.2 microns and 10 microns thick.

24. A method for packaging at least one microscopic device, comprising:

forming a housing with at least one aperture over the microscopic device;

depositing a protective material adjacent at least a portion of the housing, wherein the protective material at least flows into at least one aperture of the housing, sealing the aperture, but does not flow into at least one of the movable regions of the microscopic device; and

curing the protective material.

25. The method of Claim 24 wherein the step of forming of the housing with at least one aperture further comprises:

applying a sacrificial material to at least one microscopic device;

applying a layer of structural material adjacent the sacrificial material, the layer of structural material forming a housing adjacent at least a portion of the sacrificial material;

creating one or more apertures in the housing of structural material to expose at least a portion of the adjacent sacrificial material; and

removing the sacrificial layer, wherein the housing of structural material with at least one aperture remains.

26. The method of Claim 25, wherein the sacrificial layer has a higher etch rate than the structural material.

27. The method of Claim 26, wherein the sacrificial material comprises either a photoresist or a polyimide material.

28. The method of Claim 25, wherein the structural layer is selected from a group of Silicon Dioxide (SiO_2) and Silicon Nitride (Si_3N_4).

29. The method of Claim 25, wherein the step of removing portions of the structural layer is at least configured to use sputter etching or ion beam milling.

30. The method of Claim 25, wherein the step of removing the sacrificial layer is at least configured to use chemical etching.

31. The method of Claim 25, wherein the step of removing the sacrificial layer is at least configured to use plasma ashing or plasma etching.

32. The method of Claim 25, wherein the step of applying a structural material comprises forming a structural layer between 0.2 microns and 20 microns thick.

33. The method of Claim 25, wherein the step of applying a sacrificial material comprises forming a sacrificial layer is between 0.2 microns and 10 microns thick.

34. An apparatus for packaging a microscopic device, comprising:

mean for forming a housing with at least one aperture over the microscopic device;

means for depositing a protective material adjacent at least a portion of the housing, wherein the protective material at least flows into at least one aperture of the housing, sealing the aperture, but does not flow into at least one of the movable regions of the microscopic device; and

means for curing the protective material.

35. The apparatus of Claim 34, wherein the means for forming a housing with at least one aperture further comprises:

means for applying a sacrificial material to at least one microscopic device;

means for applying a layer of structural material adjacent the sacrificial material, the layer of structural material forming a housing adjacent at least a portion of the sacrificial material;

means for creating one or more apertures in the housing of structural material to expose at least a portion of the adjacent sacrificial material; and

means for removing the sacrificial layer, wherein the housing of structural material with at least one aperture remains.

36. The apparatus of Claim 35, wherein the means for applying a sacrificial material is at least configured to utilize sacrificial layer has a higher etch rate than the structural material.

37. The apparatus of Claim 36, wherein the means for applying a sacrificial material is at least configured to

utilize an organic material comprising with photoresist or polyimide.

38. The apparatus of Claim 35, wherein the means for applying a structural material is at least configured to utilize a material selected from a group of Silicon Dioxide (SiO_2) and Silicon Nitride (Si_3N_4).

39. The apparatus of Claim 35, wherein means for removing portions of the structural layer is at least configured to use sputter etching or ion beam milling.

40. The apparatus of Claim 35, wherein the means for removing the sacrificial layer is at least configured to use chemical etching.

41. The apparatus of Claim 35, wherein the means for removing the sacrificial layer is at least configured to use plasma ashing or plasma etching.

42. The apparatus of Claim 35, wherein the means for applying a structural material applies a structural layer between 0.2 microns and 20 microns thick.

43. The apparatus of Claim 35, wherein the means for applying a sacrificial material applies a sacrificial layer is between 0.2 microns and 10 microns thick.

44. A method for packaging at least one microscopic device, comprising:

forming a housing with at least one aperture over the at least one microscopic device;

depositing a protective material adjacent at least a portion of the housing, wherein the protective material flows at least partially into at least one aperture of the housing, sealing the aperture, but does not flow into at least one of the movable regions of the microscopic device; and

curing the protective material.

45. The method of Claim 44 wherein the forming of the housing with at least one aperture further comprises:

applying a sacrificial material to at least one microscopic device;

applying a layer of structural material adjacent the sacrificial material, the layer of structural material forming a housing adjacent at least a portion of the sacrificial material;

creating one or more apertures in the housing of structural material to expose at least a portion of the adjacent sacrificial material; and

removing the sacrificial layer, wherein the housing of structural material with at least one aperture remains.

46. The method of Claim 45, wherein the sacrificial layer has a higher etch rate than the structural material.

47. The method of Claim 46, wherein the sacrificial material comprises either a photoresist or a polyimide material.

48. The method of Claim 45, wherein the structural layer is selected from a group of Silicon Dioxide (SiO_2) and Silicon Nitride (Si_3N_4).

49. The method of Claim 45, the step of removing portions of the structural layer is at least configured to use sputter etching or ion beam milling.

50. The method of Claim 45, wherein the step of removing the sacrificial layer is at least configured to use chemical etching.

51. The method of Claim 45, wherein the step of removing the sacrificial layer is at least configured to use plasma ashing or plasma etching.

52. The method of Claim 45, wherein the step of applying a structural material comprises forming a structural layer between 0.2 microns and 20 microns thick.

53. The method of Claim 45, wherein the step of applying a sacrificial material comprises forming a sacrificial layer is between 0.2 microns and 10 microns thick.

54. An apparatus for packaging at least one microscopic device, comprising:

means for forming a housing with at least one aperture over the at least one microscopic device;

means for depositing a protective material adjacent to at least a portion of the housing, wherein the protective material flows at least partially into at least one aperture of the housing, sealing the aperture, but does not flow into at least one of the movable regions of the microscopic device; and

means for curing the protective material.

55. The apparatus of Claim 54 wherein the means for forming the housing with at least one aperture further comprises:

means for applying a sacrificial material to at least one microscopic device;

means for applying a layer of structural material adjacent the sacrificial material, the layer of structural material forming a housing adjacent at least a portion of the sacrificial material;

means for creating one or more apertures in the housing of structural material to expose at least a portion of the adjacent sacrificial material; and

means for removing the sacrificial layer, wherein the housing of structural material with at least one aperture remains.

56. The apparatus of Claim 55, wherein the means for applying a sacrificial material is at least configured to utilize sacrificial layer has a higher etch rate than the structural material.

57. The apparatus of Claim 56, wherein the means for applying a sacrificial material is at least configured to utilize an organic material comprising with photoresist or polyimide.

58. The apparatus of Claim 55, wherein the means for applying a structural material is at least configured to utilize a material selected from a group of Silicon Dioxide (SiO_2) and Silicon Nitride (Si_3N_4).

59. The apparatus of Claim 55, wherein the means for removing portions of the structural layer is at least configured to use sputter etching or ion beam milling.

60. The apparatus of Claim 55, wherein the means for removing the sacrificial layer is at least configured to use chemical etching.

61. The apparatus of Claim 55, wherein the means for removing the sacrificial layer is at least configured to use plasma ashing or plasma etching.

62. The apparatus of Claim 55, wherein the means for applying a structural material applies a structural layer between 0.2 microns and 20 microns thick.

63. The apparatus of Claim 55, wherein the means for applying a sacrificial material applies a sacrificial layer is between 0.2 microns and 10 microns thick.

64. A method for packaging at least one microscopic device, comprising:

providing a gas atmosphere, wherein the pressure is greater than or equal to 1 Pascal (Pa);

providing a temperature of less than 600° Celsius (C);

forming a housing with at least one aperture over the at least one microscopic device;

depositing a protective material adjacent to the housing; and

curing the protective material.

65. An apparatus for packaging at least one microscopic device, comprising:

means for providing a gas atmosphere, wherein the pressure is greater than or equal to 1 Pascal (Pa);

means for providing a temperature of less than 600° Celsius (C);

means for forming a housing with at least one aperture over the at least one microscopic device;

means for depositing a protective material adjacent to the protective material; and

means for curing the protective material.

66. A method for packaging at least one microscopic device, comprising:

forming a housing with at least one aperture over the at least one microscopic device;

placing a protective material adjacent to at least a portion of the housing forming a protective layer on the housing, wherein the protective material extends at least partially into at least one aperture of the housing, sealing the aperture, but does not extend into at least one of the movable regions of the microscopic device; and

allowing or causing the protective layer to harden.

67. An apparatus for packaging a microscopic device, comprising:

a housing having at least a portion positioned out of contact with the microscopic device, and having one or more apertures; and

a protective layer deposited over the housing, wherein the protective layer comprises material at least partially extending into and sealing at least one aperture of the housing and remaining out of contact with the microscopic device.